DEPARTMENT OF THE ARMY
UNITED STATES ARMY TANK - AUTOMOTIVE AND ARMAMENTS COMMAND
ARMAMENT AND CHEMICAL ACQUISITION AND LOGISTICS ACTIVITY
ROCK ISLAND, ILLINOIS 61299-7630

REPLY TO
ATTENTION OF

18 FEB 1998

Chemical and Field Support Division - Branch A

SUBJECT: Amendment to Solicitation DAAE20-97-R-0209

Gentlemen:

The purpose of this letter is to amend Solicitation DAAE20-97-R-0209 for Pneumatics Small Arms Ranges as follows:

(1) Clin 0007 and Clin 0008 are deleted in their entirety.

(2) The Guam range (Clin 0004) is changed from a Modified Record-Fire (MRF) range type to a Combat Pistol Qualification Course (CPQC) range type. The #Targets for the Guam range are changed from 45 to 35, and the NMFS is eliminated as CPQC range types do not use them.

Offerors are instructed to complete the pricing lines, Pages 1 through 5 of Attachment 01. The aforementioned revisions are made to the Schedule at Attachment 01, and to Paragraph 11.7 of the Scope of Work at Attachment 02.

(3) Clarification is provided in response to technical questions which have been posed to the Government. Each offeror should utilize this information in the preparation of his offer in response to subject solicitation.

Question #1: Is the purpose of the conduit to protect the tubing, or to provide an easier means of replacing the tubing in the event of leakage?

Answer #1: The purpose of the conduit is to protect the tubing exposed to the elements above the ground.

Question #2: If a contractor elects to use Schedule 40 PVC pipe as the means to distribute air throughout the range, would the conduit requirement of this paragraph apply?

Answer #2: Yes, for that tubing exposed above ground.

Question #3: Is all tubing to be totally exposed in conduit from the moment it enters the ground at the compressor building until it emerges in a target emplacement? Or, is protective conduit only required where the tubing comes out of the ground at the emplacement and would be exposed to the elements?

Answer #3: Protective conduit is only required where the tubing is exposed to the elements.

Question #4: Also, is the air header mentioned in your previous answer the place where the air is taken out at an emplacement to power that Infantry Target Device?

Answer #4: No. The Air Header is the buried PVC pipe that conveys air from the compressor to the target.

Question #5: A contractor comment recommended the column title "# Targets " (presented in the Scope of Work, Paragraph 11.7 and the answer to Question #3 in Amendment 0002 to subject solicitation) be retitled "# Target Locations." The contractor also recommended the column titled "# Dbl-Tgt" in the Scope of Work be retitled "#Dbl-Tgt Locations."

Answer #5: Per Amendment 0002 to subject solicitation, the Government has previously clarified the issue of targets verses double target arms, i.e., 150 verses 270 emplacements. The Government wants 150 target emplacements, of which 120 mount double target arms and 30 mount single targets. There is no change to the Scope of Work based on the contractor's suggestion.

This amendment hereby extends the closing date for receipt of offers from 3:45 P.M., CT, 18 Feb 98, to 3:45 P.M., CT, 26 Feb 98.

Offerors are instructed to compete, sign, and return this amendment, as well as the basic solicitation.

All other terms and conditions remain unchanged.

Suzanne C. Yackley

Suzanne C. Yackley
Contracting Officer

Attachments

Name of Offeror or Contractor

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	-NOTICE- EXCEPT FOR NOTES AND GENERAL INFORMATION RELATING TO THE SCHEDULE, SECTIONS B, C, D, E & F ARE CONSTRUCTED AT CONTRACT LINE ITEM LEVEL.				
0001	SECTION B - Supplies or Services and Prices/Costs NSN: 6920-10-000-0000 NOUN: PNUMATIC RANGE-FT. BLISS SECURITY CLASS: UNCLASSIFIED				
0001AA	PRODUCTION QUANTITY PRON: M17W4322M1 AMS CD: 5370162062	1	LT	$_____	$_____
	SECTION E - Inspection and Acceptance INSPECTION: DESTINATION ACCEPTANCE: DESTINATION				
	SECTION F - Deliveries or Performance DOC REL CD: 001 MILSTRIP: W52H097216T630 SUPPL ADDR: Y00000 SIG CD: M MARK FOR: TP CD: 2 DEL REL CD: 001 QUANTITY: 1 DAYS AFTER AWARD: 60				
	FOB POINT: DESTINATION				
	*** CLIN 0001AA ***				
	SHIP TO: (Y00000) PARCEL POST ADDRESS SHIPPING INSTRUCTIONS FOR CONSIGNEE (SHIP TO) WILL BE FURNISHED PRIOR TO SCHEDULED DELIVERY DATE FOR ITEM REQUIRED UNDER THIS REQUISITION.				
	CLIN 0001AA IS FOR A COMBAT PISTOL QUALIFICATION COURSE (CPQC) PNEUMATIC RANGE TO BE INSTALLED AT FT. BLISS, TX. (End of narrative F001)				
0002	SECTION B - Supplies or Services and Prices/Costs NSN: 6920-01-000-0000 NOUN: PNUMATIC MPMG-FT. SILL SECURITY CLASS: UNCLASSIFIED				
0002AA	PRODUCTION QUANTITY PRON: M17W2322M1 AMS CD: 5370162062	1	LT	$_____	$_____

ATTACHMENT 01

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	SECTION E - Inspection and Acceptance INSPECTION: DESTINATION ACCEPTANCE: DESTINATION SECTION F - Deliveries or Performance DOC SUPPL REL CD MILSTRIP ADDR SIG CD MARK FOR TP CD 001 W52H097212T631 Y00000 M 2 PROJ CD BRK BLK PT DAJ DAYS AFTER DEL REL CD QUANTITY AWARD 001 1 60 FOB POINT: DESTINATION *** CLIN 0002AA *** SHIP TO: PARCEL POST ADDRESS (Y00000) SHIPPING INSTRUCTIONS FOR CONSIGNEE (SHIP TO) WILL BE FURNISHED PRIOR TO SCHEDULED DELIVERY DATE FOR ITEM REQUIRED UNDER THIS REQUISITION. CLIN 0002AA IS FOR A MULTI-PURPOSE MACHINE GUN TRANSITION (MPMG) PNEUMATIC RANGE TO BE INSTALLED AT FT. SILL, OK. (End of narrative F001)				
0003	SECTION B - Supplies or Services and Prices/Costs NSN: 6920-01-000-0000 NOUN: PNUMATIC RG-FT STEWART(MRF) SECURITY CLASS: UNCLASSIFIED				
0003AA	PRODUCTION QUANTITY PRON: M17W8322M1 AMS CD: 5370162062	1	LT	$_____	$_____
	SECTION E - Inspection and Acceptance INSPECTION: DESTINATION ACCEPTANCE: DESTINATION SECTION F - Deliveries or Performance DOC SUPPL REL CD MILSTRIP ADDR SIG CD MARK FOR TP CD 001 W52H097216T632 Y00000 M 2 PROJ CD BRK BLK PT DAJ DAYS AFTER DEL REL CD QUANTITY AWARD 001 1 90 FOB POINT: DESTINATION *** CLIN 0003AA ***				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	SHIP TO: PARCEL POST ADDRESS (Y00000) SHIPPING INSTRUCTIONS FOR CONSIGNEE (SHIP TO) WILL BE FURNISHED PRIOR TO SCHEDULED DELIVERY DATE FOR ITEM REQUIRED UNDER THIS REQUISITION. CLIN 0003AA IS FOR A MODIFIED RECORD-FIRE (MRF) PNEUMATIC RANGE TO BE INSTALLED AT FT. STEWART, GA. (End of narrative F001)				
0004	SECTION B - Supplies or Services and Prices/Costs NSN: 6920-01-000-0000 NOUN: PNUMATIC RANGE-GUAM (CPQC) SECURITY CLASS: UNCLASSIFIED				
0004AA	PRODUCTION QUANTITY PRON: M17A6322M1 AMS CD: 5370162062	1	LT	$_____	$_____
	SECTION E - Inspection and Acceptance INSPECTION: DESTINATION ACCEPTANCE: DESTINATION				
	SECTION F - Deliveries or Performance DOC REL CD: 001 MILSTRIP: W52H097220T630 SUPPL ADDR: Y00000 SIG CD: M MARK FOR: TP CD: 2 PROJ CD: DAJ BRK BLK PT DEL REL CD: 001 QUANTITY: 1 DAYS AFTER AWARD: 90				
	FOB POINT: DESTINATION *** CLIN 0004AA *** SHIP TO: PARCEL POST ADDRESS (Y00000) SHIPPING INSTRUCTIONS FOR CONSIGNEE (SHIP TO) WILL BE FURNISHED PRIOR TO SCHEDULED DELIVERY DATE FOR ITEM REQUIRED UNDER THIS REQUISITION. CLIN 0004AA IS FOR A MODIFIED RECORD-FIRE (MRF) PNEUMATIC RANGE TO BE INSTALLED IN GUAM. (End of narrative F001)				
0005	SECTION B - Supplies or Services and Prices/Costs NSN: 6920-01-000-0000 NOUN: PNUMATIC RG- FT. CARSON, CO SECURITY CLASS: UNCLASSIFIED				
0005AA	PRODUCTION QUANTITY PRON: M17CQ322M1	1	LT	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	AMS CD: 5370162062 SECTION E - Inspection and Acceptance INSPECTION: DESTINATION ACCEPTANCE: DESTINATION SECTION F - Deliveries or Performance DOC SUPPL REL CD MILSTRIP ADDR SIG CD MARK FOR TP CD 001 W52H097232T638 Y00000 M 1 PROJ CD BRK BLK PT DAJ DEL REL CD QUANTITY DAYS AFTER AWARD 001 1 120 FOB POINT: DESTINATION *** CLIN 0005AA *** SHIP TO: PARCEL POST ADDRESS (Y00000) SHIPPING INSTRUCTIONS FOR CONSIGNEE (SHIP TO) WILL BE FURNISHED PRIOR TO SCHEDULED DELIVERY DATE FOR ITEM REQUIRED UNDER THIS REQUISITION. CLIN 0005AA IS FOR A MULTI-PURPOSE MACHINE GUN TRANSITION (MPMG) PNEUMATIC RANGE TO BE INSTALLED AT FT. CARSON, CO. (End of narrative F001) SECTION B - Supplies or Services and Prices/Costs				
0006	NSN: 6920-01-000-0000 NOUN: PNUMATIC RG-FT STEWART(MPMG) SECURITY CLASS: UNCLASSIFIED				
0006AA	PRODUCTION QUANTITY PRON: M17A3322M1 AMS CD: 5370162062 SECTION E - Inspection and Acceptance INSPECTION: DESTINATION ACCEPTANCE: DESTINATION SECTION F - Deliveries or Performance DOC SUPPL REL CD MILSTRIP ADDR SIG CD MARK FOR TP CD 001 W52H097216T633 Y00000 M 2 PROJ CD BRK BLK PT DAJ DEL REL CD QUANTITY DAYS AFTER AWARD 001 1 150 FOB POINT: DESTINATION	1	LT	$	$

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	*** CLIN 0006AA *** SHIP TO: PARCEL POST ADDRESS (Y00000) SHIPPING INSTRUCTIONS FOR CONSIGNEE (SHIP TO) WILL BE FURNISHED PRIOR TO SCHEDULED DELIVERY DATE FOR ITEM REQUIRED UNDER THIS REQUISITION. CLIN 0006AA IS FOR A MULTI-PURPOSE MACHINE GUN TRANSITION (MPMG) PNEUMATIC RANGE TO BE INSTALLED AT FT. STEWART, GA. (End of narrative F001)				
0007	DELETED				
0008	DELETED				
0009	SECTION B - Supplies or Services and Prices/Costs NSN: 6920-01-000-0000 NOUN: PNUMATIC CPQC- FT. SILL SECURITY CLASS: UNCLASSIFIED				
0009AA	PRODUCTION QUANTITY PRON: M17CE322M1 AMS CD: 5370162062	1	LT	$_____	$_____
	SECTION E - Inspection and Acceptance INSPECTION: DESTINATION ACCEPTANCE: DESTINATION SECTION F - Deliveries or Performance DOC REL CD: 001 MILSTRIP: W52H097232T634 SUPPL ADDR: Y00000 SIG CD: M MARK FOR: TP CD: 1 PROJ CD: DAJ BRK BLK PT: DEL REL CD: 001 QUANTITY: 1 DAYS AFTER AWARD: 240 FOB POINT: DESTINATION *** CLIN 0009AA *** SHIP TO: PARCEL POST ADDRESS (Y00000) SHIPPING INSTRUCTIONS FOR CONSIGNEE (SHIP TO) WILL BE FURNISHED PRIOR TO SCHEDULED DELIVERY DATE FOR ITEM REQUIRED UNDER THIS REQUISITION. CLIN 0009AA IS FOR A COMBAT PISTOL QUALIFICATION COURSE (CPQC) PNEUMATIC RANGE TO BE INSTALLED AT FT. SILL, OK. (End of narrative F001)				

SCOPE OF WORK

PNEUMATIC SMALL ARMS RANGE

1. **SCOPE:**

As a part of the continuing effort to conserve training resources, a requirement exists to construct Pneumatic Small Arms Ranges (PSAR) taking full advantage of current technology and its related economics. The PSAR will utilize pneumatic actuation to raise and lower the targets. The range will be controlled by a Target Control Console (TCC) located in a tower.

2. **APPLICABLE REFERENCE DOCUMENTS:**

TC 25-8, Army Training Ranges.
CEHND 1110-1-5, USACE Design Manual for Ranges
CEHND 1110-1-15, USACE Design Manual for Ranges
ANSI B93.114M, Pneumatic Fluid Power-System Standard for Industry (NFPA/T2.25.1M)
ANSI/NFPA 70-96, National Electrical Code

3. **PERFORMANCE SPECIFICATIONS:**

The target system shall be complete from the manufacturer to include: target lifter, target lighting, coffins, basic earth work (trenching using standard trenching tools), target berms, all electrical conduit, wire and power supplies, hit sensors, computer interface and printer, installation, and any other items necessary to meet the following general specifications.

3.1. The PSAR, as a minimum, shall consist of a TCC, target devices, an air compressor and all materiel necessary to fully equip Army standard small arms ranges. Examples of the range types are described in TC 25-8 (Army Training Ranges) and CEHND 1110-1-15 (USACE Design Manual for Ranges). Each range configuration shall be determined by its use and the number of lanes established for that location and range type. The type and location of the ranges to be installed under this SOW will be in accordance with the schedule found in paragraph 11. Each range shall contain target lifting devices capable of accepting commands from the Target Control Console (TCC).

3.2. The Range System shall contain, but not be limited to, the following items;

- Target Control Console (TCC)
- Printer
- SVGA Monitor
- Target Lifting Devices
- Air Compressor, sufficient to supply actuation air to the entire range
- Air and electrical conducting materiel
- Target Coffins and berms.
- Night Muzzle Flash Simulator

3.3. In addition to the above, the contractor shall provide the following technical and training support;

- New equipment training (NET)
- Installation and testing

ATTACHMENT 02

- Two year commercial warranty

3.4. The following data items shall be provided by the contractor;

- Operator's Manual
- Repair and technical manuals to support all repair actions.

3.5 Specific specifications for the major components of the range system are as follows;

3.5.1. **Target Control Console (TCC);**
To be located in the GFE provided range tower, shall contain, but not be restricted to, a stand alone Pentium or better IBM compatible computer with the current version of Microsoft Windows and Microsoft Disk Operating System (MSDOS), target handling software (loaded onto the TCC plus backup copies on disk), a 3 ½ floppy disk drive and a hard drive with adequate storage space for all the required software plus a minimum of 50 scenarios (this shall occupy less than 25% of the available storage capacity). The TCC shall possess the minimum capability to:

3.5.1.1. Control 256 or more independent targets (individually, by lane or row, and collectively).

3.5.1.2. Provide control commands to include up, down, down when hit, bob (down when hit than back up), down with N hits (N - 1 through 10) and night muzzle flash simulation.

3.5.1.3. Provide visual display of target scoring by single lane and all lanes.

3.5.1.4. Produce a printed record of individual lane scores as well as total record of each firing order.

3.5.1.5. Accept custom target-control scenarios from the range operator plus store and recall scenarios on command.

3.5.1.6. Create scenarios and edit them on the TCC and on any other IBM compatible PC computer. These scenarios shall also be transferable to a 3 ½ floppy disk for storage and reentry in the TCC.

3.5.1.7. Operate within a climate controlled tower in temperatures between 35 to 90 degrees Fahrenheit on ranges as detailed in paragraph 11.

3.5.1.8. Not used.

3.5.1.9. Be useable under low-light night time range tower conditions.

3.5.1.10. Provide information to a printer for a permanent record of the training activity accumulated during a particular interval. This PRINT function shall be available either in immediate mode or from within a program sequence. As a minimum, the printout shall show each successful hit and which target recorded the hit. Print capabilities shall also include individual score cards, unit summary scores, firing order, and be able to accommodate a user programmable format.

3.5.1.11.1. The target print command shall not automatically delete the target data. An option shall be provided to save the data to a hard drive or a 3 ½ floppy drive under a name to be determined by the operator. If unnamed the default shall be a date time group.

3.5.1.11.2. The computer shall be available to operate the range within 30 seconds after a print command is given, either by the operator or from the scenario.

3.5.1.12. Operate in both a scenario driven automatic mode and an operator driven manual mode. When operating in the scenario driven mode the

operator shall be allowed to stop the training, operate in the manual mode, and return to the same place the exit occurred, to resume the scenario mode.

3.5.1.13. Operate without interfering with or being interfered by standard hand held radios being operated in or near the tower. The system shall be designed to be free from electro-magnetic interference and protected from damage from inadvertent electrostatic discharge by the user.

3.5.1.14. Provide a minimum target exposure time of 2 seconds, with the capability of setting the duration in the scenario in time increments of at least 1 second.

3.5.1.15. Register hits in less than 1 second after the target begins to be exposed or raised, without registering false hits due to target bounce resultant from the upward motion of the target while raising the Army standard E, F, and 3-D infantry target.

3.5.1.16. Night muzzle flash simulation must be adjustable with the time between flashes adjustable (the minimum time between flashes shall be .5 seconds or less). The flash duration shall be adjustable down to a minimum of .5 seconds.

3.5.1.17. Target activation in a scenario shall be based on both elapse time of exposure and sequential activation as targets are killed (attrition). This shall be capable of being programmed into the scenario.

3.5.2. **Infantry Target Device;** Shall be constructed so as to;

3.5.2.1. Be weather-proof and corrosion-resistant. The device shall not be damaged by driving rain, blowing dust, and snow or ice buildup.

3.5.2.2. Have a minimum of mean time between failure of 20,000 cycles for each target position.

3.5.2.3. Be capable of purging moisture from air tubing automatically without action by range personnel, to protect the mechanism from freezing.

3.5.2.4. Fit without modification into pre-fabricated target coffins described in paragraph 3.5.7., and be capable of being mounted to the headwall of the target coffin, or to a stable horizontal platform and contain quick-release mechanisms that allow the device to be disconnected from air and electricity for maintainability. The quick disconnects shall be designed to preclude frequent accidental disconnects.

3.5.2.5. Be installed so there is a minimum of 6 inches clearance between standing ground water and electrical components, as found after a moderate rain, unless the components are designed for underwater service.

3.5.2.6. Accept commands from the TCC and provide scoring data to the TCC. As a minimum the commands will include up, down, down when hit, bob, down with N hits (N= 1 through 10) and night muzzle flash simulation.

3.5.2.7. Operate in all environmental conditions found on US military ranges world wide as detailed in paragraph 11. The mechanism must be adaptable for use in weather conditions where the temperatures can range from -20 to +120 degrees Fahrenheit, with the humidity ranging up to 100% and where rain or snow, and dusty and sandy conditions exist.

3.5.2.8. Lift Army standard E, F, and 3-D targets in one second or less, without regard to snow or soil accumulations on the targets and in winds up to 25 mph. The lowering of the target shall be in less than 1 second.

3.5.2.9. Have a local test switch for on-site maintenance activation of the target at each target pit.

3.5.2.10. Respond to bullet strikes, as a minimum between 5.56 mm and 50 caliber. The type response shall include down when hit, bob when hit, down with N hits (N=1 to 10) depending on the scenarios and range demands.

3.5.2.11. Be installed so that when one target position fails others will continue to function normally.

3.5.2.12. Be capable of raising two targets within a berm area at the same time for machine gun training. The two targets shall be capable of being scored as one target with a kill on one causing both targets to go down and score one hit.

3.5.2.13. The target device shall be designed to offer the user the option to replace the contractors standard hit sensor with the M31A1 hit sensor. This option shall require no more than an adapter which allows the use of the M31A1 sensor.

3.5.3. **Air compressor** shall be;

3.5.3.1. Commercially available, with sufficient Standard Cubic Feet per Minute(SCFM) capacity to raise and lower all targets on the small arms range at a rate of 5 cycles or more per minute, raising all targets in less than 1 second at a calm no load condition, using the standard Army 3-D target.

3.5.3.2. Capable of using 240 VAC, 60 cycle, single phase range power.

3.5.3.3. Equipped to automatically remove moisture from air being supplied to the target devices, and contain adequate air drying capacity to insure reliable range operation for humidity conditions up to 100%, as well as, during adverse winter conditions which are normally experienced at the site where the range is installed. The air dryers shall be capable of being regenerated, while on line, without removal of the dryer or a drying element during the regeneration cycle. The purging of the air storage tank shall be automatic and frequent enough to eliminate freezing under winter conditions experienced at the site where the range is installed.

3.5.3.4. Operate for a minimum of 10 years with normal maintenance and repairs in all temperature and humidity conditions found on US military installations identified in paragraph 11.

3.5.3.5. The compressor shall be located in a building as defined in 3.5.6.7.

3.5.4. **Pneumatic lines** shall be installed using:

3.5.4.1. Standard commercial quality tubing with a minimum 10 year expected life in pneumatic service.

3.5.4.2. Tubing capable of withstanding operating temperatures between -20 and +120 degrees Fahrenheit and system pressures up to 120 psi without damage.

3.5.4.3. Not used.

3.5.4.4. Protective conduit to enclose all tubing, and equipped with a permanent tag identifying its connection by lane and row. No air lines are to be exposed to the environment except when making a connection to hardware.

3.5.4.5. Isolation/shut-off valves shall be installed so that each lane can be isolated for repair.

3.5.4.6. Automatic blow down valve which shall ensure that there is no moisture buildup at low points that can restrict air flow or freeze.

3.5.4.7. Whatever method is required to install the air lines, they shall be buried to a depth below the frost line for the area or a minimum of thirty six inches below the surface whichever is deeper.

3.5.4.8. The pneumatic system shall adhere to the requirements of ANSI B93.114M unless stated otherwise.

3.5.5. **Electrical power:**

The contractor shall provide connection for all devices from commercial electrical distribution boxes. The Government will be responsible for providing 240/120 VAC, 60 cycle, single phase electrical service to the range, which will be terminated at a breakout box with a single throw lock out breaker. This box will be within 20 feet of the power station/compressor building. The Government will provide a 120 volt outlet in the tower.

3.5.6. **The PSAR System** shall;

3.5.6.1. Not used.

3.5.6.2. Not used.

3.5.6.3. Utilize quick-connect type connectors for pneumatic connections at the target positions, and where practical, in the compressor building.

3.5.6.4. Be installed in accordance with all applicable national, state and local electrical and ASME pneumatic pressure codes.

3.5.6.5. Be protected from damage from lightning that passes over or strikes near the range. The protection provided shall be designed for ease of failure detection, diagnostics, and repair. If isolation is required to provide lighting protection, no tools shall be required for the isolation, and any disconnection of the hardware shall not result in more than minimal degradation of the cables, wires and connectors. The entire isolation shall be accomplished by one man in less than 5 minutes.

3.5.6.6. All electrical work shall be grounded in accordance with said applicable codes. All electrical wires coming from the ground shall be enclosed in contractor-provided protective conduit.

3.5.6.7. The compressor, and all auxiliary equipment such as manifolds, surge tank, air dryers, interface devices, and associated hardware shall be housed in a contractor provided protective building. The building shall be adequately sized and constructed to provide environmental protection for the equipment, and allow for maintenance of the installed equipment. The building will be located on the GFE pad defined in paragraph 11.2.

3.5.7. **The Target Coffin and Berms** shall:

3.5.7.1. Be made from pre-formed galvanized steel plates of sufficient size and weight to support, enclose and protect the target mechanism and the target when retracted. The protection for the target mechanism is from damage caused by rounds being fired down range during training.

3.5.7.2. A new oak or similar density hardwood material tie, not containing creosote preservative, measuring a minimum of 7 x 9 inches by

4 feet shall be installed across the top of each coffin to eliminate damage to the coffin from low shots. This protection shall also sufficiently isolate the target mechanism so that vibrations from low shots shall not be detected as a hit by the target hit sensor.

3.5.7.3. The berms shall be of adequate density to protect the coffin from short rounds. The multipurpose machine gun ranges shall have berms adequate to protect the target mechanism from rounds up to 50 caliber. The berm construction will be determined by the range design and weapons fired on that range. Informational designs for berms can be found in CEHND 1110-1-15.

3.5.7.4. Provide protection for the target mechanism from rounds fired at angles up to 60 degrees to the right or left of the target position, and provide adequate interior clearance for maintaining the target lifting mechanism.

3.5.7.5. Not conceal more than 6 inches of the base of the target when in the up position while insuring that the mechanism is still protected.

3.5.7.6. When the target is in the concealed position, it shall not be visible from firing personnel 30 feet away.

3.5.8. **Night Muzzle Flash Simulator** shall:

3.5.8.1. Be capable of being added to the infantry target lifting device as found in paragraph 3.5.2., with no modification to the lifting mechanism and using the same power provided to actuate the lifting device.

3.5.8.2. Provide for night muzzle flash simulation controlled by the scenario. The minimum flash duration can be .5 seconds or less with a maximum as controlled by the scenario. When minimum flash duration is used, there shall be a distinct on-off visual separation detected between each flash. The night muzzle flash simulation shall realistically provide a simulation of the threat weapon muzzle flash.

4. **TEST AND EVALUATION:** The contractor shall perform or have performed, the tests required to substantiate that the hardware provided under the contract performs to the requirements of this SOW.

4.1. **Test Plan:** A test plan shall be composed which provides assurance that the range installed is in compliance with each paragraph of section 3 of this SOW (paragraphs 3. through 3.5.8.2.). This test plan shall be a contractor developed Government reviewed functional demonstration plan for acceptance of the ranges.

4.1.1. **Testing:** The test plan shall be fully demonstrated on the first range installed.

4.1.1.1. The testing plan shall include a 50 cycle test of the entire range. First raising and then lowering all the targets 50 times with no failures. The test will be repeated until 50 cycles can be completed on the entire range with no failures. The range fails this acceptance test after unsuccessfully repeating the test 5 times.

4.1.1.2. A live fire test is also required for each target. This test shall demonstrate the capability of the system to score a hit from a weapon as determined by the range design (pistol for CPQC, machine gun for MPMG, etc.), with a minimum of one round in each target being scored and confirmed.

4.1.2. **Review:** This plan shall be submitted to the Government contracting officer, at least 30 working days prior to the demonstration. If the demonstration can be satisfied by inspection, quantitatively, or

qualitatively, this shall be so indicated in the plan along with a description of how the requirement is demonstrated.

4.1.3. **Certification:** Any portion of the plan which can not be demonstrated or inspected, shall be certified by the contractor and so annotated on the plan. The Government reserves the right to inspect and approve the certifications as required during the warranty period.

5. **TRAINING:**

The contractor shall provide on-site training courses for both operators and maintainers. Operator's training shall include classroom instruction in system operation and scenario-writing, as well as, a functional walk-through of the range. The operators portion of the training shall be a minimum of 8 hours long. Maintenance training shall include preventive maintenance, operator-level repairs, and activating of built-in self-tests, and shall be at least 16 hours long. Final acceptance of the range is contingent on range personnel's satisfaction with the training received, and their confidence that they can operate and maintain the range with the materials and training provided. Manuals and training shall be provided to the range for up to 20 people in both the maintenance and the operator training.

6. **MAINTENANCE:** The Range system must;

- Be maintainable by current range maintenance personnel
- Be supported by the contractor for all system-unique repair parts for at least 10 years. System-unique repair parts are manufactured specifically for the items installed on this range, and which do not have application or use on similar systems. This normally consists of parts manufactured from drawings controlled by the contractor, or items procured for use on the PSAR which only have application to PSAR ranges.
- Include a listing of common repair parts and a list of the recommended 1-year supply of those parts. This listing, shall be based on the contractors past experience and their projection for the maintenance of the range.
- Be maintainable using common tools. Extraordinary tools required for maintenance of the range shall be supplied, as part of this contract, by the contractor at the time of installation.

7. **TECHNICAL MANUALS:**

The contractor shall provide at least 10 sets of their standard operation and maintenance manuals for each small arms range. The operator's manual shall include instruction in operation of the TCC as well as scenario writing and recording. The maintenance manual shall contain troubleshooting procedures for the target devices and the TCC as well as any interconnecting circuitry. The two manuals can be combined into one manual providing it is easy to understand. In addition, the manuals shall contain a complete parts list with manufacturer's code and stock number, as well as a listing of any special tools required. Additional alternate supply source information, where applicable, shall also be provided with the maintenance manuals. Each maintenance manual shall contain a section or an insert listing the contractor's recommended spare parts, required to maintain the range, and to ensure that the range is operational 95% of the time. A set of the final versions of the manuals with inserts shall also be delivered to;

Department of the Army
Armament and Chemical Acquisition and Logistics Activity
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8. **PRODUCT ASSURANCE:**

8.1. **Reliability and Maintainability:** The contractor shall provide hardware that meets commercial standards of reliability performance.

8.2. **Configuration Management:** The contractor will maintain configuration control and documentation of all design and design changes as pertain to this SOW. The contractor shall be responsible for notifying the Government of all design changes made after the base line established with the installation of the first range. This base line is established by this SOW and the installation of the first range for the replacement assemblies and spare parts, parts lists, manuals, and software. The contractor shall maintain documentation of this baseline for the duration of this contract.

8.3. **Product Support:** The contractor shall make every effort to provide for supply of repair and replacement parts to support the range for a minimum of 10 years after the termination of this contract. During the 10 year life of the ranges, the contractor should insure that all future product improvements are downward compatible with the ranges installed under this SOW, or that adequate system unique replacement parts are available to support the ranges for 10 years.

9. **WARRANTY:**

9.1. The contractor shall provide a commercial warranty to fix, repair or replace any defective part which does not function correctly due to latent software defects, faulty components, or workmanship for a minimum period of two (2) years from the date of acceptance by the Government. As a minimum the warranty shall contain provisions that, when a part fails due to a warranted defect, the contractor shall fix, repair, or replace the component in less than 21 calendar days after receipt of the defective component at the contractors facility. All pickup and return shipping of warranty items shall be at the contractors expense.

9.2. The contractor warrants that each hardware, software, and firmware product delivered and listed in this SOW shall be able to accurately process date data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, including leap year calculations, when used in accordance with the product documentation provided by the contractor, provided that all listed or unlisted products (e.g. hardware, software, firmware) are used in combination. If it is required that specific listed products must perform as a system in accordance with the foregoing warranty, then that warranty shall apply to those listed products as a system. The duration of this warranty and the remedies available to the Government for breach of this warranty shall be as defined in, and subject to, the terms and limitations of the contractor's standard commercial warranty or warranties. The remedies available to the Government under this warranty shall include repair or replacement of any listed product whose non-compliance is discovered and made known to the contractor in writing within ninety (90) days after acceptance. Nothing in this warranty shall be construed to limit any rights or remedies the Government may otherwise have with respect to defects other than Year 2000 performance.

10. **SYSTEM ENGINEERING:**

The contractor shall ensure human factors engineering, safety, and health hazards are to commercial standards. The components shall meet Occupational Safety and Health Agency (OSHA) safety standards. The Health Hazard Statement

shall cover hazards to users, operators, maintenance personnel and personnel adjacent to equipment.

11. **INSTALLATION:**

11.1 The contractor shall provide the Government, prior to start of range installation, a set of detailed plans which will allow the Government to monitor the installation as it progresses. This will include diagrams of the range including the wiring diagrams. The contractor will have 30 continuous calendar days to complete installation.

11.2 The Government will prepare the range for installation of the PSAR. The control tower and firing line will be GFE, and the Government will clear the range of all metal and hazardous materials in preparation for the trenching and installation of the target positions. Prior to the start of trenching on the range, the contractor shall confirm with range control personnel as to the location of each target, firing point, and lane. The Government range control officials will provide the contractor with either a drawing of the target and lane locations giving the exact location of each target mechanism or he will physically locate and mark the exact location of each target position. The target locations must be approved by the installation's range control official prior to trenching for installation of the mechanisms. The soil conditions varies from site to site and a possibility of buried cables from earlier target installations exists. The contractor shall coordinate the soil conditions prior to range installation and adjust his trenching methods accordingly.

11.3 The Government range control officials will supply the contractor with enough targets for each target mechanism. The Government will provide a concrete pad for the compressor/power building, to be built in accordance with the contractors specification for the pad. The contractor shall provide the Government Contracting Representative with plans and or specifications detailing the minimum requirements for the pad within 1 month after contract award.

11.4 The Government will provide a supply of dirt adequate for the construction of the berms. This dirt supply will be located within 1000 feet of the range.

11.5 Removal of all debris generated by installation of the Range System shall be the responsibility of the contractor. The contractor shall reclaim and seed the range where the contractor has disturbed the ground during range installation.

11.5 Upon completion of installation by the contractor and the Government's acceptance of the installation portion of the contract, the contractor shall back fill all trenches. The contractor shall take adequate steps that insure normal compacting and settling of the soil around the air lines and cables will not break the airlines during the warrantee period.

11.6 The contractor shall comply with all Federal, State, and local environmental and safety requirement while performing work under this contract. While on the site the contractor shall also conform with and attend any local required range safety, vehicle access, down range access regulations and meetings.

11.7 The proposed location, type, and installation dates are listed below:

1998 Installation Estimate

Range	Type	# Lanes	# Targets	NMFS	# Dbl-Tgt
Ft. Stewart, GA	MPMG	10	150	0	120

Ft. Carson, CO	MPMG	10	150	0	120
Ft. Stewart,GA	MRF	16	144	32	0
Ft. Sill, OK	CPQC	15	105	0	0
Guam	CPQC	05	035	0	0
Ft. Bliss, TX	CPQC	15	105	0	0
Ft. Sill, OK	MPMG	10	150	0	120

11.8 The above range locations and future ranges are primarily located within the continental USA. In 1998 it is anticipated that Guam will be the only site outside the continental USA. Installation pricing shall include any anticipated additional expenses which might be experienced. The Government reserves the right to substitute ranges with similar ranges and locations.

11.9. Provide for, a 120 VAC, 15 amp, standard 3 prong, weather proof, ground fault interrupter connector which is grounded to a common neutral ground at each target position on all MRF and MPMG ranges. The outlet will be used for power tools and possible future thermal applications. The buried electrical lines shall be electrically isolated to prevent interference with the data transmission for the target positions with a minimum of 1 ft. separation between lines.

11.10. A "buried cable below" tape (or similar marking material) shall be buried 1 foot above the buried cables. Where 2 or more buried cables are in the same trench, 1 tape per cable is required.

11.11. Upon acceptance of the range, the contractor shall provide the range control officer with a set of as built drawings showing, as a minimum, the location of all buried lines, all buried cables, all control valves, and all typical air line and wire diagrams.